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Carol Brooksbank, June 1996 FORMAT :-

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Vol.10 N°1.

September 1996.

FORMAT

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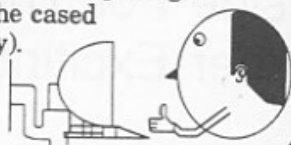
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ALSO INCLUDED AS A PULL-OUT SUPPLEMENT IN THIS ISSUE

FORMAT's Spectrum & SAM Resource Directory

THE EASY WAY TO SOURCE YOUR NEEDS

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NEWS ON 4

ELITE FOR SAM

Revelation Software have announced that they plan to launch a port of the Spectrum version of the highly successful space trading/fighting game *Elite* for SAM at the next Gloucester show in October.

Elite was originally written for the BBC micro and was one of the most acclaimed and addictive games of its time. Translated to many machines including the C64, Amstrad CPC and the PC - the Spectrum version was always acknowledged as one of the slickest and most playable versions produced. Revelation have had a special front-end written that allows them to use a modified version of the original Spectrum code while allowing *SAVES* and *LOADs* to work on the SAM's disc.

The game will come complete with the proper manuals which show you how to fly your ship and give copious advice on trading, the story book which sets the scene for the game, and a large space ship identification poster for your wall.

WINNERS ALL

Revelation have also announced the winners of the prize draw it held in conjunction with the recent survey it carried out (see last month's *News On 4*).

The three winners, who each received an item from Revelation's catalogue, are: Alan Hawes of Isleworth in Middlesex, Dr. Gerhard Behr of Briersfield in Lancashire, and Jennifer Oxbury of St Leonard On Sea in Sussex.

Revelation would like to pass on their thanks to all who filled in the survey sheets. The full results are still being worked on but early indications are that most interest was shown in games that require thought (rather than just fast reflexes). More details as they are released by Revelation.

SPECTRUM MANUAL

The original Spectrum manual has now been converted into computer readable form and is available on the PC in Windows Write format. The manual, without doubt the best ever produced for a home computer was written by Steven Vickers and edited by Robin Bradbeer. It has been converted to electronic text by Chris Owen. The full text, including all the examples is given and there is even a Jpeg graphics file of the front cover in colour should you ever want to print it out.

You can obtain a copy from one of several sites on the Internet. If you don't have Internet access then you can order a copy on disc from us here at **FORMAT**. The price if you want a disc is £4.95 which includes UK postage.

CHEAPER DRIVE KITS

In response to user's letters on the subject, West Coast Computers have announced new versions of the SAM replacement disc drive kits. They will now supply the kits without the expensive 1772 disc controller chip which, more often than not, is not the cause of the breakdown of the old slim-line drives. So all you have to do is gently remove the chip from your old drive - and save £10 in the process.

YOUR NEWS HERE...

Come on readers, we need your news. Anything related to computers which you think will interest other SAM and Spectrum owners. Just jot it down on a piece of paper, add your name and membership number, and send it off to us at the usual address. Please mark the envelope 'News' so that we can give it the priority it deserves.

Remember, you get three months extra subscription for every news item we print, so don't rely on others to send in an item you have seen - send it off yourself and earn our thanks as well.

The Editor Speaks

Well here it is folks! The very first issue of volume TEN, and of course we wanted to make it a special issue. But what could we do? How could we make this issue *EXTRA* special?

The answer came in a flash of inspiration, which then forced me to take several days off to recover. The idea grew, of producing a directory, to be included with this issue. It would list all the companies that owned up to still producing products, or providing a service, that would interest Spectrum and SAM users like yourselves.

Well, after much hard work (by Jenny I hasten to add) the directory has come together - just in time for this special birthday issue. The Spectrum and SAM Resource Directory is sandwiched in the middle of this issue of **FORMAT** but could be removed and kept separate if you really want. I have to say that there were quite a few companies that did not reply to the questionnaires we sent out - some people seem too lazy even to fill out a form for a free entry. However, it is by far the most comprehensive directory of the Spectrum and SAM scene produced in recent times and I'm sure you will all find it both interesting and useful.

If the demand is there, we may update the directory and print it again at some point in the future - so let us know what you think of it and also tell us about any companies that are not in this issue (they could be one of the companies that did not reply, but you might know of someone we have missed from our mailing list).

Apart from the Birthday celebrations, there is a lot of work going on here to prepare for both the Wetherby show (on

the 21st September, see the advert in this issue) and of course the next Gloucester show on the 26th October. Remember that if Wetherby is not well attended then the chances of another Northern show are remote - it's up to you readers to turn out in large numbers, and with lots of money, to encourage companies to attend future shows in the North. The same applies equally to the Gloucester show, we need people to come along and support the efforts of all the software and hardware companies - because your support and encouragement is what is needed to help keep things going.

Work on the new **FORMAT** PC continues, albeit slower than I would have liked, and it is hoped that the first issue will be out very soon. I'm still looking for writers for the new mag, and indeed for an editor to take on part of the job of putting together the future issues. The money will be pitifully low to begin with but for the right person I think there will be a bright future as **FORMAT** PC grows. The only qualifications for the editors job are: reasonable English, reasonable knowledge of PCs, access to a PC capable of running AmiPro (the package we use for producing mags here) and, if at all possible, access to the Internet for email services. If you are interested then get in touch and we can have a chat about it.

Of course, at the same time, I'm always looking for more writers for **FORMAT** itself. Articles on any subject greatly received.

Until next month.

Bob Brenchley, Editor.

NSSS

Saturday 21st September

At the Methodist Hall,
Wetherby, West Yorkshire.

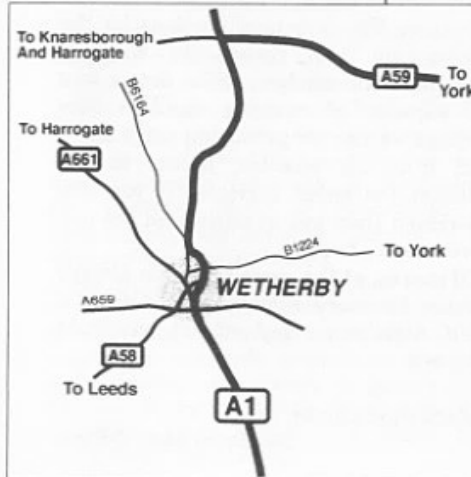
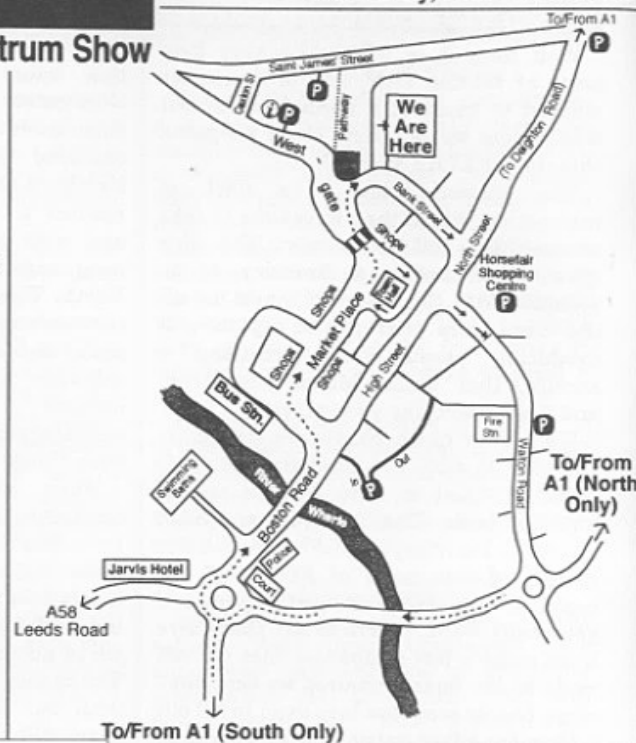
The Northern SAM & Spectrum Show

On the 21st of September the first Northern SAM & Spectrum Computer Show will take place in Wetherby, a town between Leeds and York and is just off the A1. All the major SAM and Spectrum companies will be there including **Format, Fred, Crashed, Alchemist Research, Persona, Fountain PD**, and many more. Doors open to the public at 10:30 and close at 4pm.

GETTING TO THE SHOW

For people coming North, simply take the first turning for Wetherby, then follow the map on the right (you'll turn up at the left-hand roundabout). If you're travelling South, however, you should take the junction which is signposted for the **A58 to Leeds**. There will be NSSS signs at these junctions, too.

Once at the roundabout which is on the left-hand side of the map above, take the exit to Wetherby (which will also have an NSSS sign). Once over the bridge, take the first **left**. This road will bend round to the **right**, straighten out,



then bend to the **left** over a pedestrian crossing. Once past the crossing, turn **right** onto Bank Street. The hall is on your left.

PARKING

There is limited parking behind the hall itself, but there are many other car parks, most of them free, within a few minutes walk from the hall. Turning right after the bridge will take you to a 200 space free car-park, and the two car parks which are to the left of the hall on the map are also free.

Entry is charged at £1.50 for adults, £1 for under 14's and under 5's are free. Doors open 10:30am - 4pm.

If you have any questions or require information on public transport, places to stay, etc. then call Allan or Daniel on (0113) 237 4800, fax (0113) 237 4349, or send an SSAE to: NSSS, 123 Potternewton Lane, Chapel Allerton, Leeds, LS7 3LW.

SHORT SPOT

YOUR HINTS, TIPS AND PROGRAMMING IDEAS

Edited By:- John Wase.

I still can't cope with it. Once again, it's necessary for me to sit in my underpants and string vest, and turn the Rayburn to minimum, so I'm not fried, and it's all humid and sticky and I can't cook my breakfast in the top of the hot oven (entirely mess-free) and I'm hot, sticky, ill-fed and FED UP. So there! I'm stale. I need a holiday. And I'm going to have one - beginning of September. So, if September's Short Spot is a little bit abbreviated, I'm sure you'll understand, 'cos I'll have done it before I go abroad.

There's another reason for it to be abbreviated. We all know the old computer adage "Garbage in; garbage out". Sure; it applies to sloppy programmers; to me as much as anyone else, but if no-one sends me anything, I can't print anything. So unless I get some more stuff, **THERE WON'T BE AN OCTOBER SHORT SPOT!** So send me something quickly. Please! Even if you think it's garbage!

And by the same token, once you've sent some stuff for my immediate needs, stop and think Christmas. See if you can work out some nice Chrimbles shorties *early* for a change!

Now, first to correct my bloopers. Roy Burford of Norton, Stourbridge, writes (bless him, I'd be very short of material this month if he hadn't) to mention that in August's **FORMAT**, the machine which produced the listing of his program 'Frere Jaques', featured on page 7, somehow interpreted the keyword **PLAY** as **BRIGHT...** Ooh 'Eck: apologies all round. [Editor's note: The problem occurred in

the translation process. You see what I have to do is: first convert the Spectrum Basic program file onto SAM (using the converter program written by Dr Andy Wright which is on the **SAMDOS** disc), then I convert the SAM Basic version into ASCII text using SD Software's PC Suite and then, again with PC Suite I transfer the program to PC disc for inclusion into the text of Short Spot which John always sends me on a PC disc anyway.

So where is the problem? Well the **PLAY** command is not one that the conversion program understands (having been designed for 48K Basic) and so it just plonked another keyword into the slot.

My fault, I should have noticed. *Ed.*

The next thing from Roy is a little letter in which he declares he's re-invented the wheel. As usual, there's a bit more to it than that. Recently, Roy decided to use a **SAVE/VERIFY** routine at the head of programs he was developing, and found that changing the program name at least twice (four times for the example) each time he loaded the routine invited errors. So, as a new twist, Roy tried putting the program name into a string variable. It turns out that **G+DOS** does not accept bare string variables, and the manual was no help. Trial and error determined that concatenating a null string in front of the string variable solved the problem.

This listing is a real short spot, and is for a dual **SAVE/VERIFY**. Essentially, it explains itself. A **GOTO 5** is all that is needed anytime to save ones current program. Usually these **SAVE** routines

appear at the bottom of most FORMAT programs and the string variable can clearly be used for this case also. Here we are...

```
1 REM
2 REM
4 GOTO 10
5 LET p$="programe": SAVE d1*
  "+p$: VERIFY d1**+p$: SAVE
  d2**+p$: VERIFY d2+p$: STOP
10 REM Program code
```

Roy mentions that he's now using this regularly, and finds the idea very useful, and thinks it might interest Spectrum users if it hasn't been suggested before. I certainly haven't seen it, Roy. Three cheers to you.

Roy also writes about Simon Turk's problem (what; he's only got one)? This turned up on page 9 of last month's offering. In the first place, Roy mentioned that it would have been helpful to have a brief, concise description of what he was trying to do, as the listing seems long and complicated. Boiled down to basics, it seems that he is dealing with the problem of padded strings on the Spectrum. Roy is worried that his solution is too naive (does this *really* solve the problem, Simon). All Roy's program does is to pad out the word searched for to match the array dimensions, so that a direct comparison can be made as the array is stepped through. Roy's used the top part of his program, and has added some prompts and REMs to show what he seems to need and what Roy's done to get there. Pretty good, Roy: and not naive at all. Here's his listing.

```
1 REM Vol.9 No12. FORMAT. Aug
  ust 1996. p9. "The Turk Pro
  blem"
2 REM Naive? solution by B.C.
  R.Burford on ZX Spectrum+ 1
  28K 220896.
```

```
4 GOTO 40
5 LET p$="wordsearch": SAVE d
  1**+p$: VERIFY d1**+p$: STO
  P : SAVE d2**+p$: VERIFY d2
  **+p$: STOP
40 INPUT "How many columns(cha
  racters in word? ";c
50 INPUT "How many rows(number
  of words? ";r
60 DIM w$(r,c): LET p$="
  ": LET s$=p$(
  20-c+1 TO ): REM 20 spaces
  in p$, c spaces in s$
70 FOR i=1 TO r
90 PRINT "Input row ";i
100 INPUT a$
110 IF LEN a$>c THEN GOTO 100
120 LET w$(i)=a$
130 NEXT i
150 CLS
160 FOR y=1 TO r
170 PRINT AT y,1:w$(y)
180 NEXT y
200 INPUT "Word ";a$: LET s=LEN
  a$
205 REM Pad out a$ with spaces
  to be c characters long
210 IF LEN a$<c THEN LET a$=a$+
  s$(LEN a$+1 TO )
220 FOR f=1 TO r
230 IF a$<>w$(f) THEN LET n=1:
  GOTO 250
240 LET l=f: LET f=r: LET n=0
250 NEXT f
255 IF n=1 THEN PRINT a$( TO s)
  ;" not found": GOTO 270
260 PRINT "The word ";a$( TO s)
  ;" is on row ";l
270 PRINT "Another word? Y/N:"
280 LET q$=INKEY$
285 IF q$="" THEN GOTO 280
290 IF q$="Y" OR q$="y" THEN GO
  TO 200
300 STOP
  Many thanks Roy.
```

Let's turn now to Doug Casterton of Hucknall, Notts, who writes for SAM. He's the man I mentioned, who has programs to deal with games fixtures. But there's a snag. Listen...

Doug writes as follows about compiling league fixtures... He says that although the same basics apply to many types of

leagues, the following examples apply specifically to cricket leagues. Most cricket clubs have at least two teams, a 1st XI and a 2nd XI, who both share the same ground. Cricket leagues are therefore generally structured with:-

- two separate competitions; one for the 1st XI teams and another for the 2nd XI teams, or
- a single competition for both 1st and 2nd XI teams, with the 2nd XI finding its own level within the divisions, but always at least one division lower than the 1st XI.

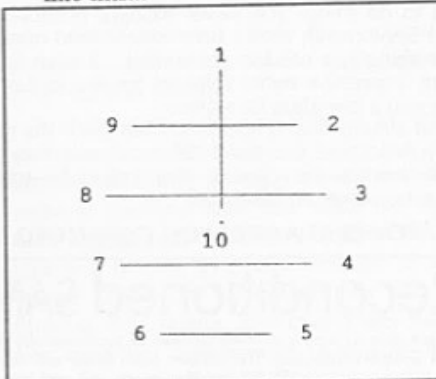
I hope you understand what Doug is driving at, because, not being a very sporting man, I have some problems in understanding all these complicated concepts. Anyway, Doug clarifies this by mentioning that in Nottinghamshire, there are two of each sort among the four major leagues which together number over 300 teams. The ideal fixture list has the season divided into two halves. Each team plays each of the others in the first half of the season, generally at home or away on alternate weeks. The second half of the season is the same sequence, but with the venues reversed.

For the league with two separate competitions, there is a program which, Doug understands, is based on information which appeared in Science Weekly a long time ago, and which was given to Doug by a fellow-member of the Nottingham Microcomputer Club in October 1988.

As an example, for a division of ten teams....

- Draw a circle.
- Draw a radius from centre to top dead centre.
- Outside the circle at the top of the radius put the number 1.
- At the bottom of the radius put number 10.

- Place numbers 2 to 9 equally spaced clockwise outside the circle.
- Draw chords at right angles to the radius and between the numbers. The diagram should look something like this...



- For the first week; 1v10, 2v9, 3v8, 4v7, 5v6...
- For the second week, leave the numbers in position, but rotate the lines so that the radius now points to 2, and the chords are also rotated appropriately. Reverse the venue. 10v2, 1v3, 9v4, 8v5, 7v6...
- Repeat for the total of 18 weeks.

The program listing of 'Modulo' will produce a fixture list for a division of any number of teams. In the full program, the number of each team is raised for subsequent divisions and the venues are reversed for the 2nd XI competition so that placing the 1st and 2nd XI teams of a club in the same position in any division of their respective competition will ensure that when the 1st XI is at home, the 2nd XI is away and *vice versa*.

So much for type 'A' leagues.

```
800 CLS : INPUT "Please enter
  the number of teams in the
  division ";t
810 CLS : PRINT AT 8,0;"1..Out
  put to screen"; AT 10,0;"2
  ..Output to Printer": INPU
```

SAM elite 512

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In most cases we find the faults with old drives are mechanical (due to worn heads, stepper motor failure, etc.) In these cases you need an Internal Interface Type 1 to which you transfer the 1772 disc controller chip from your old drive - thus making the upgrade as cheap as possible.

If you want to fit a second drive (or first drive, if you don't have one or the 1772 on your old drive is faulty) then order a Type 2.

Both types are available in either kit form or ready assembled. For the kit you will need screwdriver, soldering iron, solder and a reasonable level of soldering skills. All you need for the assembled version is a screwdriver. Full fitting instructions are given and the only other thing you need is a standard PC type disc drive from your local supplier (cost about £20 to £25).

If you have any doubts about which type of interface you need, or any questions about the drive fitting in general, then please give the FORMAT hotline a ring on 01452-412572 and they will be pleased to help you.

	Kit Form	Assembled
Internal Disc Interface Type 1 (without 1772)	£19.95	£29.95
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West Coast Computers

INTERFACES

These interfaces work with both the SAM elite and the SAM Coupé unless otherwise stated.

SAM MOUSE SYSTEM Interface, High Quality Mouse and the Software to drive it. The interface plugs into the mouse port on the back of SAM so you don't need a spare expansion socket. More and more software now works better if you use a mouse. **Only £39.95**

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TWOUP Allows two interfaces to be connected to SAM's expansion port at same time. **Only £19.95**

XDI The eXternal Disc Interface. Allows external 3 1/2" or 5 1/4" drive to be connected to SAM Coupé. Also includes Parallel Printer Interface. **Only £44.95**

ALSO AVAILABLE: Printer Cable - £7.95, SCART Cable - £7.95, Replacement Keyboard £14.95, Replacement Power Supply - please ring. Plus spare parts service - tell us what you want and we will give you a price.

```
T p: LET p=p+1
820 IF p=3 THEN CLOSE #3: OPEN
    #3:"p"
900 LET dy1=2*(t-1),gm=t/2
910 modulo
920 pnt_fixts
925 DEF PROC modulo
930 LOCAL i,k,j
940 DIM hm(dy1,gm),wy(dy1,gm):
    REM arrays for home & awa
    y teams.(days,games)
950 REM Draw radials,put home
    & away in respective array
960 FOR i=1 TO dy1
970 LET k=1+((i-1) MOD (t-1))
980 IF i MOD 2=1 THEN LET hm(i
    ,1)=k,wy(i,1)=t: ELSE LET
    hm(i,1)=t,wy(i,1)=k
990 REM Draw chords & put in a
    rrays
1000 FOR j=2 TO (gm)
1010 IF i MOD 2=1 THEN LET hm(i
    ,j)=1+((k-2+j+t-1) MOD (t-
    1)),wy(i,j)=1+((k-j+t-1) M
    OD (t-1)): ELSE LET hm(i,j
    )=1+((k-j+t-1) MOD (t-1)),
    wy(i,j)=1+((k-2+j+t-1) MOD
    (t-1))
1020 NEXT j
1030 NEXT i
1040 END PROC
1640 DEF PROC pnt_fixts
1650 LOCAL i,j
1660 REM print out the arrays
1670 CLS
1680 PRINT #p;". "
1690 FOR i=1 TO (t-1)*2
1700 PRINT #p;i; TAB 4;
1710 FOR j=1 TO gm
1720 PRINT #p;hm(i,j);"/";wy(i
    ,j);" "
1730 NEXT j
1740 PRINT #p
1750 NEXT i
1770 END PROC
```

Type 'B' is made difficult in that there is no clear cut split between 1st and 2nd XI teams in the divisions. In addition, there are cases of single team clubs sharing a ground with another single team club in the same division or even in a different league. Thankfully only a few, but they can cause havoc! Chris Higginbottom, a colleague, compiles the

fixtures for a type 'B' league with 11 divisions, each of 12 teams. His solution is to conform (generally) to the basic requirements regarding separating the season into two halves and alternate home/away sequence, additionally, each odd number team has the opposite home/away sequence to the next higher even number team.

So now, even teams sharing a ground and playing in the same division can be accommodated by placing one in an odd number position and the other in the next higher even number position. With this is a fixture list for a division of 10 teams. There is a similar one for a division of 12 teams. However, these lists are compiled empirically. Copying all those numbers for 11 divisions is not only tedious but error-prone. Poor Doug! He goes on to say, wistfully, that a computer program to generate such a list directly would be more professional, more accurate, quicker and more fun. "If only," he says, "I had the ability."

"Can anyone out there," he appeals, "Write a program to generate a fixture list for a division of any number of teams within the above constraints?"

Well: come on, folks. We've had a solution to Simon Turk's problems; I'm sure someone can help Doug.

Finally, (it was a good long letter), Doug writes about the chore of drawing teams for the various rounds of a cup competition. "You've probably seen it on television," sagely remarks Doug. Actually, Doug, that's where I always turn it off, or at least change channels! Anyway, to do this, they need to call a meeting, book a room, one man to draw the home team, another man to draw the away team, a third to write it down and a bag of balls. It's not like that with SAM!

Doug reduced this performance by adapting a routine he came across some

ten years ago either in INPUT or in ZX COMPUTING which shuffled 10 articles amongst 10 rooms in an adventure game.

Set up the program by typing the names of the teams into DATA statements, name of competition and number of the round in another. Then telephone a fellow League Officer, and ask him to choose a number between 1 and 65535, to tell you, then to write it down and save it.

Enter the number, and within 3 seconds, (for 16 teams), the printer will print out the complete listing, complete with the seed number to prove no cheating. This list will work without Master Basic.

```
10 REM CupDraw2
20 CLS : PRINT AT 8,0;"1..Out
  put to Screen"; AT 10,0;"2
  ..Output to Printer":
30 INPUT i$: LET p=VAL i$: LE
  T p=p+1
40 IF p<2 OR p>3 THEN GOTO 20
50 INPUT "Enter the SEED No.(
  1-65535)";seed
60 PRINT seed: RANDOMIZE seed
  : PAUSE 100
70 LET g=16
80 DIM a$(g,16): DIM a(g)
90 RESTORE
100 FOR z=1 TO g
110 READ a$(z)
120 LET a(z)=z
130 NEXT z
140 RESTORE 310: READ h$: READ
  c$
150 FOR x=g-1 TO 2 STEP -1
160 LET q=1+RND(x-1)
170 LET t=a(x),a(x)=a(q),a(q)=
  t
180 NEXT x
190 IF p=3 THEN CLOSE #3: OPEN
  #3;"p"
200 IF p=3 THEN CLS : INPUT "H
  ow many copies to print ?"
  ;c: FOR i=1 TO c:printout:
  NEXT i: ELSE printout
210 DEF PROC printout
220 PRINT #p;h$
230 PRINT #p;: PRINT #p;c$
240 PRINT #p;'
```

```
250 FOR t=1 TO g-1 STEP 2: PRI
  NT #p;(t+1)/2; TAB 2;a$(a(
  t));"v ";a$(a(t+1)): NEXT
  t
260 PRINT #p;: PRINT #p;"See
  d is ";seed
270 IF p=3 THEN CLOSE #5: OPEN
  #5;"b": PRINT #5;CHR$ 12;
280 END PROC
290 DATA "Sherwood","Boots","C
  avaliers","Albert Hall","B
  ulwell","Basford Corins","
  Rolls Royce","Castle Don",
  "Hucknall","Ellerslie","Nu
  thall"
300 DATA "Civil Service","Stan
  ton","County Wands","G.P.T
  .","Trowell","Dunkirk"
310 DATA "The Mapperley Sports
  Notts Amateur Cricket Lea
  gue"
320 DATA "The Popkess Cup. Rou
  nd 2 to be played on 5th J
  une."
```

Many thanks, Doug, for all your efforts.

To end with, here's a bit of fun for everyone from - guess who! Simon Turk of Tunbridge Wells. It's a SAM game, all about Percival Pig. Percival is trapped in his pen on a windy night. Apples are being blown into his pen from the tree above, and Percival must eat these as soon as possible after they've fallen to the ground. The longer he takes to eat an apple, the fewer points you get. How many apples can he eat before he crashes into the pen or yourself?

```
10 REM make a pig of yourself
15 FOR l=21776 TO 21776+63: R
  EAD a: POKE l,a: NEXT l
20 DIM h$(10,20): DIM h(10)
30 FOR l=1 TO 10: LET h$(l)="
  SIMON TURK": LET h(l)=(11-
  l)*100: NEXT l
40 DEF PROC wall
50 PRINT AT 0,0;STRING$(32,CH
  R$ 149)
60 FOR l=1 TO 18: PRINT AT l,
  0;CHR$ 150: PRINT AT l,31;
  CHR$ 150: NEXT l
70 PRINT AT 18,0;STRING$(32,C
```

```
HR$ 149)
80 END PROC
90 DEF PROC init
100 DIM f(17,30)
110 PRINT AT 9,1; PEN 3;STRING
  $(4,CHR$ 148);CHR$ 145
120 FOR l=1 TO 4: LET f(9,l)=1
  : NEXT l
130 LET score=0: LET moves=0:
  LET hx=5: LET hy=9: LET tx
  =1: LET ty=9: LET way=1
140 END PROC
150 DEF PROC disco
160 PRINT AT 0,0;"SCORE=";scor
  e
170 END PROC
180 DEF PROC keys
190 IF INKEY$="7" THEN LET way
  =1
200 IF INKEY$="8" THEN LET way
  =2
210 IF INKEY$="6" THEN LET way
  =3
220 IF INKEY$="9" THEN LET way
  =4
230 LET moves=moves+1: IF move
  s/15=INT (moves/15) THEN d
  e cay
240 END PROC
250 DEF PROC head
260 IF way=4 THEN PRINT AT hy,
  hx; PEN 3;CHR$ 148: LET f(
  hy,hx)=way: LET hy=hy-1: I
  F hy<1 THEN crash: ELSE IF
  f(hy,hx)<>0 THEN crash: E
  LSE PRINT AT hy,hx; PEN 3;
  CHR$ 144
270 IF way=3 THEN PRINT AT hy,
  hx; PEN 3;CHR$ 148: LET f(
  hy,hx)=way: LET hx=hx-1: I
  F hx<1 THEN crash: ELSE IF
  f(hy,hx)<>0 THEN crash: E
  LSE PRINT AT hy,hx; PEN 3;
  CHR$ 147
280 IF way=2 THEN PRINT AT hy,
  hx; PEN 3;CHR$ 148: LET f(
  hy,hx)=way: LET hy=hy+1: I
  F hy>17 THEN crash: ELSE I
  F f(hy,hx)<>0 THEN crash:
  ELSE PRINT AT hy,hx; PEN 3
  ;CHR$ 146
290 IF way=1 THEN PRINT AT hy,
  hx; PEN 3;CHR$ 148: LET f(
  hy,hx)=way: LET hx=hx+1: I
  F hx>30 THEN crash: ELSE I
```

```
F f(hy,hx)<>0 THEN crash:
  ELSE PRINT AT hy,hx; PEN 3
  ;CHR$ 145
300 END PROC
310 DEF PROC tail
320 IF f(ty,tx)=4 THEN PRINT A
  T ty,tx;" ": LET f(ty,tx)=
  0: LET ty=ty-1: GOTO 190
330 IF f(ty,tx)=3 THEN PRINT A
  T ty,tx;" ": LET f(ty,tx)=
  0: LET tx=tx-1: GOTO 190
340 IF f(ty,tx)=2 THEN PRINT A
  T ty,tx;" ": LET f(ty,tx)=
  0: LET ty=ty+1: GOTO 190
350 IF f(ty,tx)=1 THEN PRINT A
  T ty,tx;" ": LET f(ty,tx)=
  0: LET tx=tx+1: GOTO 190
360 END PROC
370 DEF PROC appleinit
380 LET apst=7: LET ax=INT (RN
  D*29)+1: LET ay=INT (RND*1
  6)+1: IF f(ay,ax)<>0 OR (h
  x=ax AND hy=ay) THEN GOTO
  380
390 END PROC
400 DEF PROC appleprn
410 PRINT AT ay,ax; PEN apst;C
  HR$ 151
420 END PROC
430 wall:init:appleinit
440 DO :disco:appleprn:keys:he
  ad:tail: LOOP UNTIL hx=ax
  AND hy=ay
450 ZAP :addsc:head:appleinit:
  GOTO 440
460 DEF PROC crash
470 CLS : IF score<=h(10) THEN
  PRINT AT 0,0;"You didn't
  make it into the hallof fa
  me": PAUSE :disp$
480 FOR l=1 TO 10: IF score>(h
  (l)) THEN GOTO 482
481 NEXT l
482 FOR s=10 TO 1+1 STEP -1
483 LET h$(s)=h$(s-1): LET h(s
  )=h(s-1)
484 NEXT s
485 LET h(1)=score: PRINT "Wel
  l done you made it into th
  e hall of fame.": INPUT "
  Please enter your name ";
  LINE a$: IF a$="" THEN LET
  a$="MR NO NAME"
486 LET h$(1)=a$
487 disp$
```



```

490 END PROC
500 DEF PROC decay
510 LET apst=apst-1: IF apst=0
    THEN LET apst=1
520 END PROC
530 DEF PROC addsc
540 LET score=score+(apst*5)
550 IF apst=7 THEN LET score=s
    core+50
560 END PROC
570 DEF PROC dispac
580 CLS : PRINT AT 0,11;"Hi Sc
    ores"
590 FOR l=1 TO 10: PRINT AT l+
    2,0,: IF l<>10 THEN PRINT
    " ";
600 PRINT l; TAB 4;h$(l); TAB
    26;
610 LET a$=STR$(h(l))
620 IF LEN a$<5 THEN LET a$="
    "+a$: GOTO 620
630 PRINT a$: NEXT l
640 PAUSE : CLS : GOTO 40
650 END PROC
1000 DATA 16,56,124,254,214,254
    ,254,124
1010 DATA 120,252,238,255,238,2
    52,120,0
1020 DATA 124,254,254,214,254,1
    24,56,16
1030 DATA 0,30,55,127,247,127,6
    3,14
1040 DATA 28,126,126,255,255,12
    6,126,60
1050 DATA 0,16,254,40,68,254,66
    ,0
1060 DATA 38,44,52,100,52,44,38
    ,36
1070 DATA 0,8,20,58,124,124,124
    ,56

```

So type it in and have fun

And that's all for this month, 'cos it's almost all I've got. Please dig around in your drawers; send me some snippets NOW! Without them I can't put a column together! Please send them to:-

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The Spectrum Light-Gun

By:- Paul Farrow.

Although many Spectrum +2As and +3s were sold packaged with a light-gun, very little commercial software (apart from that bundled with the systems) was ever produced. Without commercial support the light-gun is practically useless as it cannot be directly read from Basic. However, the concepts involved in reading the light-gun are quite straightforward and easy to implement and so this is the motive behind this article.

The routines developed will be written with the 128K Spectrum version of the light-gun in mind, although it should be quite simple to adapt these routines to a 48K Spectrum as the principles will be the same, provided you could find some way of interfacing the light-gun.

The electronics inside the light-gun are quite simple and consist of a number of stages. The light received down the gun's barrel is intensified by a lens and is then picked up by a light sensor. This generates an electrical signal which varies with the amount of light that falls on the sensor. The signal is quite small and so the next stage amplifies it such that a digital signal is produced which indicates the presence or absence of light. This signal is then buffered and presented to pin 4 of the KEYPAD/AUX socket on the Spectrum 128. The light-gun trigger is simply a switch which presents +12V to pin 5 of the KEYPAD/AUX socket when it is pulled.

The connections of the KEYPAD/AUX

socket are as follows:-

PIN	FUNCTION
1	0V
2	n/c
3	n/c
4	SENSOR
5	TRIGGER
6	+12V

Note that pin 6 is on the same side of the socket as that of the clip mechanism.

If Sinclair Research had conceived that the Spectrum might need to support a light-gun (or light-pen) then they might have decided to design extra functions into the Spectrum ULA to assist in determining the position that the light-gun is pointing at. However, this is unfortunately not the case and so once again in the Sinclair world software must be called upon to save the day. In order to understand how this can be achieved, it is important to understand the manner in which the TV picture is produced and displayed.

A normal TV picture is composed of 625 lines. Each update of these 625 lines constitutes one frame. There are 25 such frames generated per second. In order to reduce the amount of flicker noticed on the TV, these 625 lines are divided into two sets of 312.5 lines each. Each field as it is known is then generated every 50th of a second with alternate fields consisting of either all the even or all the odd numbered lines. These sets of lines are vertically offset from each so that

they do not overwrite each other. This effect is known as interlacing. The other important principal on which TV is based is the human eye's persistence of vision phenomena whereby the eye retains the image it has received for a small length of time even after the original light source has disappeared. All that is required to produce an acceptable TV picture is to ensure that the 625 lines are re-generated before the eye 'loses' the image it is currently retaining. Out of the 625 lines that compose a normal TV picture, only 575 actually contain picture information. The other 50 lines contain teletext information as well as the synchronization information used to tell the TV set when the start of each field occurs.

In a Spectrum, a non-interlaced TV picture is produced, i.e. 50 identical fields are generated every second. For each field, tests show that the top border of the display consists of 64 scan lines, which equates to 20.48% of the field. The main display area is composed of 192 scan lines (61.44%) and hence the bottom border contains 56.5 scan lines (18.08%). The TV screen has an aspect ratio of 4:3 and so for square pixels there must be appropriately 400 pixels in each scan line. Then assuming the left and right hand borders are of equal width, both must consist of 72 pixels and hence each occupies 18% per scan line. The main screen area thus accounts for 64% of each scan line.

At the start of each TV picture, the Spectrum's CPU is interrupted by the ULA chip causing it to stop executing the program it is currently running and to begin a routine programmed into the ROM. This routine consists of the keyboard scanning routine and is also responsible for incrementing the

FRAMES counter that is used by the PAUSE command to keep track of real time. By redirecting these interrupts to jump to our own routine, we can then proceed to monitor the light-gun as each of the TV scan lines is generated and hence determine on which line the light-gun registers 'seeing' light. This works because the light-gun does not have the same retention abilities as the human eye and so it is able to 'see' individual TV scan lines as they are generated; all other lines would appear black to it. However, there is a small degree of 'persistence of vision' which is most probably caused by the phosphors used on the inside of the TV screen. This effect means that irrespective of how far across the scan line the light-gun is pointing at, we only need to read it once in order to determine whether it has detected light on this line. We will therefore read the light-gun at the end of each scan line. However, there is the disadvantage that it provides no information on how far across the scan line the light-gun was pointing at. It would seem far better to read the light-gun after each pixel in the line was produced and thus we instantly know the column value as soon as the light-gun 'sees' light, but unfortunately we can not do this for the simple reason that the Spectrum does not run fast enough. The best we could achieve would be to read the light-gun about half a dozen times or so. Note that the light-gun will register light no matter what colour it is looking at except for black which is an absent of light. Also the light-gun is more sensitive to bright pale colours, and hence bright white is easier for the light-gun to detect than a dull blue.

To determine which column the light-gun is pointing at we will have to

adopt a rather inelegant solution. This involves highlighting a group of columns whilst blanking the rest and then monitoring the light-gun immediately after the scan line of interest has been produced. If the light-gun detects light then it must have been pointing at the highlighted section. If it did not then we highlight a different group of columns and repeat the process. Eventually, we will detect the column that the light-gun is pointing at, but note that every test requires a fresh TV picture to be generated. If we were to test each column one at a time, then we would require 32 tests and hence 32 TV fields. As each field takes 0.02 seconds, a total of $32 \times 0.02 = 0.64$ seconds would be required which is far too impractical for most purposes. Also note that each column consists of 8 pixels and if we were to highlight groups of pixels instead of groups of columns then the number of tests required and the time taken would increase enormously. There are three other things to note at this point. First, the light-gun does not appear to be sensitive enough to detect single pixels; a square consisting of 9 pixels seems to be the smallest area that can be detected reliably. Second, there is a speed advantage in using columns as we can manipulate the attributes files, i.e. changing one byte in the attributes file will highlight 64 pixels in one go. Third, the sensitivity and accuracy of the light-gun is related to the distance it is from the TV screen, and so for greater reliability it is better to highlight large areas.

Now the most efficient way to determine the column position is to highlight half of one row, i.e. 16 columns, and then detect whether the light-gun can see any of this light. If it can then we

know which half of the screen the light-gun is pointing at; if it can't then we know that it must be pointing at the other half of the screen. For the half that we believe that the light-gun is pointing at, we now highlight only half of this, i.e. 8 columns, and check if the light-gun can now see light. After each test we bisect the highlighted area and repeat the test on the light-gun until we eventually determine which column the light-gun must be pointing at. This whole procedure will only take 5 TV fields, i.e. 0.1 seconds.

Until now, the border area has not been discussed and yet the light-gun doesn't distinguish between the main screen area or one of the border areas. Since we are not likely to be interested in determining whether the light-gun is pointing at the top border, we will simply not bother to test for it and will just wait while this portion of the display is being generated. As for the bottom border, we will finish all tests on the light-gun for this field once all 192 rows of the main screen area have been generated, i.e. we will simply ignore the bottom border area. This now just leaves the side border areas which are unfortunately a little bit more involved to eliminate. Imagine that the border was set to a colour and that we had just followed the method detailed above to determine which column the light-gun appeared to be pointing at. Now if we had found that on each test the light-gun was seeing light, then there is the possibility that it was pointing at the border all along and so we would have produced an incorrect result. Simply setting the border to black presents the possibility that the light-gun does not see light on each test and the result we obtain could again be incorrect because the light-gun could be

pointing at the border. The only sure way to eliminate these possibilities is to make a further test. This test will form the sixth and final test and is performed on the column that we have concluded that the light-gun must be pointing at. All we do is to change the attribute for this position to a bright colour if it was black or to black if it was highlighted. If the light-gun is indeed pointing at this column then it will detect the change; if it was pointing at the border then it will not. Thus six tests, taking 0.12 seconds, allow us to reliably determine the column that the light-gun is pointing at. Now as it is most likely that both the row and column co-ordinates will be required together, a total of seven tests will be required, taking 0.14 seconds. In theory, the above procedure should work fine, but in practice there is a problem when detecting columns 0 or 31. This is due to the light-gun not discriminating between the column and its adjoining border. Thus if the border is set to a colour and the column is also set to a colour, then the light-gun is not sensitive enough to distinguish between them; light from the border finds its way into the light-gun. When testing the other columns, this effect does not occur as the columns under test have black areas to either side of them. The only sure way to eliminate this problem is to set the border colour to black when performing the column tests so that it can not interfere. The original border colour is restored afterwards via system variable BORDCR (23624).

Now it has been assumed above that the light-gun will be pointing at exactly the same point on the TV screen when each of the seven tests is performed. In practice, jitter introduced by the light-gun user's hand is enough to cause

the above procedure to fail. The effect is more prominently noticeable in the vertical direction than it is in the horizontal, and this is due to the TV picture being generated from a series of horizontal scan lines. The effect can be minimized by not only highlighting the attribute row of interest but also the rows immediately above and below it. When attempting to identify the column that the light-gun is pointing at, the program will test each scan line in all three highlighted attribute rows, i.e. 24 scan lines. Thus even if the light-gun's position varies vertically, it will still see light when a test is made. Note that rapid movement of the light-gun vertically can cause the column tests to fail. To overcome this, more rows should be highlighted. However, I have not implemented this as I have tried to keep the amount of flicker caused when detecting the column position to a minimum. There is also the danger of taking too long in highlighting rows such that the next interrupt is missed. Note also that if the attribute row of interest is at the top or bottom of the main display area, then the above procedure can only be partially implemented.

The routines developed allow the determination of the row and pixel line numbers, and for a given line the column number that the light-gun is pointing at. The ability to detect the column position irrespective of the row has not been implemented as it is less likely to be of use, although it is quite straightforward to produce this function if required. Note that detection of row/line numbers requires no change to the screen attributes provided that there is light being emitted from each line. For lines that are blank, their attributes must be temporarily changed to a colour while

the light-gun is tested. The routines developed allow all of the screen attributes to be changed to a specified colour while the tests on the light-gun are performed. The original attributes are then restored afterwards. This procedure will of course result in the whole of the main display area appearing the blink each time the routines are invoked.

To synchronize the routines to the TV field, interrupts are used. These literally interrupt the CPU stopping it from executing the current program and causing it to jump to a different routine. Interrupt mode 2 is used and this operates as follows. Upon an interrupt signal arriving at the Z80, an address out of a table of 128 addresses selected. The location of the entry to use in this table is determined by the I register which provides the high byte and the external device that generated the interrupt supplies the low byte. The external device in our case is in fact the Spectrum ULA. This does not supply a byte of data and so a default value of 255 (FF hex) ought to be read in. However, with other devices connected, it is possible that any value may be read in. This means that any entry in the table may be selected. To make matters worse, we cannot guarantee that bit 0 of the entry address will be zero, and so any one of 256 possible entries may be selected. The way to overcome this is to produce a full table with every byte the same. Thus no matter what entry is selected, the address used as the start of the interrupt routine is always the same. For convenience, the I register is set to 254 (FE hex) then the interrupt vector table is located near the top of memory. If all bytes in the table contain 253 (FD hex) then no matter which entry is

selected, address 65021 (FDFD hex) is used as the start of the interrupt routine. This is just three bytes below the start of the table and is just the right size to place a jump instruction here. Normally this jump will pass control to our interrupt routine. However, for the light-gun routine it is sufficient to contain a return from interrupt instruction RETI as this only requires two bytes. Note that an extra byte of value 253 is required at the end of the table in case the 256th entry is selected. Thus a block of 260 bytes is required which is conveniently positioned at the top of memory and yet below the UDGs table (65368 or FF58 hex). This interrupt vector table is created by the light-gun program each time it is called and is disabled prior to a return to Basic. Thus there is no conflict with the page swapping employed when in 128K Basic mode and hence the routine can be safely used in either 48K or 128K mode.

And that is where we must leave it for this month. Next month I will complete the explanation and give the source listing for the machine code routine itself. Bye for now.

SPECTRUM KEYPAD CORRECTION

In my article on the 128K's Keypad (Vol.9 N°10 June 1996) I omitted an important fact. The extra text should read:-

When the Spectrum 128 reads in nibbles of data from the keypad, the first bit received corresponds to the right hand column of keys and the last bit corresponds to the left hand column. For a key being pressed, its corresponding bit is read as a 1.

I hope this clarifies things for you.

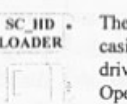


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MORE New Tricks For The Secretary

Part 3

By:- Rev. Tony Kinch.

My first two articles in this series have given the instructions for creating new printer control code files so that *The Secretary* can be used with a range of ink-jet printers - mine is an Epson Stylus 400. At the end of article 2, three new files had been created: PRN_couri, PRN_roman and PRN_T_om. These allow the full range of print styles available on that printer to be used, with each code file giving access to two fonts (PRN_couri gives access to the Roman font in its non-scaleable form as well). The font are accessed via the MISC menu using 'P LOAD PRN CODES'.

This article takes the process on a step further. By means of some new Basic procedures, the following are achieved:-

1. A 'default' font is chosen when the program is loaded.
2. The default font can be changed at any time by means of a new menu.
3. The details of the font are saved with the text, so that the appropriate font code file is loaded with the text file.
4. A procedure is created to position text vertically on the paper, so that blank lines do not have to be inserted in the text file at the top of each page.
5. An error-trapping routine is included so that the operating program and text files can be kept on separate discs if desired. (This routine also ensures that files created before these modifications were incorporated into the program can be loaded without difficulty.)
6. New Help Screens are created for each

of the fonts. (The details of this were to be incorporated in this article, but that would make it too long, so these details will be given in a final article to follow.)

The first thing that must be done is to format a new disc, and copy your DOS and *The Secretary* working program on to it. Under no circumstances should you attempt to work on your copy of *The Secretary* master disc, or even a disc in current use - the risks of making mistakes and losing your program or working files are too great. Load this new disc, and when *The Secretary* program is loaded, press ESC and RETURN. This will bring you into Basic. Throughout these program listings the statement DIR="/" is only needed if you have incorporated my subdirectory changes (*FORMAT*: January 1995). If you use Master_Dos it may be kept in whenever it appears. If you use Samdos the statement must NOT be used at all. The first routine to be created is:-

```
10050 DEF PROC saveprog: DIR="/"
      : SAVE OVER "Secretary" LI
      NE 10: END PROC
```

It is used every time you want to save up your program alterations. Simply type saveprog and then press RETURN. If you have already made the directory modifications from my article in the January 1995 issue of *FORMAT* you will already have this procedure. For the remainder of this article, any parts of the program listings which are in italics are only required if the directory

procedures are created. The next routine is 'chfnt' (change font):-

```
11100 DEF PROC chfnt
11120 CLS: LET rl=11145: ON ERROR
R GOTO prgd: GOSUB wind: m
es "select default font":
rdfnt
11125 CSIZE 8,8: PEN 2: PLOT 5,1
4 DRAW 158,0: DRAW 0,35: D
RAW -158,0: DRAW 0,-35: WI
NDOW 0,20,15,19: PEN 7: FO
R fnt=1 TO 4: LET dn=fnt
11130 PRINT AT fnt,1; PAPER 1;"
"; fnt; TAB 4; font$(fnt):
NEXT fnt: LET fnt=1
11135 PRINT AT fnt,4; PAPER 2; f
ont$(fnt): GET zz$
11145 IF CODE zz$>48 AND CODE zz
$ <52 THEN LET fnt=CODE zz
$-48: LET a$="PRN_" + font$
(fnt, 1 TO 5): LOAD a$ COD
E 106200: ON ERROR GOTO 99
00: END PROC: ELSE IF CODE
zz$=52 THEN LET fnt=4: pr
n: END PROC
11150 IF CODE zz$=13 AND fnt<4 T
HEN LET a$="PRN_" + font$(fnt,
1 TO 5): LOAD a$ CODE 1
06200: ON ERROR GOTO 9900:
END PROC: ELSE IF CODE zz
$=13 AND fnt=4 THEN prn: E
ND PROC
11155 IF CODE zz$=11 THEN PRINT
AT fnt,4; PAPER 1; font$(fnt):
LET fnt=fnt-1: IF fnt
<1 THEN LET fnt=4
11160 IF CODE zz$=10 THEN PRINT
AT fnt,4; PAPER 1; font$(fnt):
LET fnt=fnt+1: IF fnt
>4 THEN LET fnt=1
11165 GOTO 11135
```

The second procedure is 'prn' which allows for any special printer control code files you may create yourself to be loaded.

```
11170 DEF PROC prn
11175 CSIZE 8,8: CLS: DIR="/": D
IR dv "PRN_*": KEY 1,92:
INPUT "LOADING PRN CNTRL C
ODES - Enter Filename PRN_
": LINE a$: KEY 1,255: GOS
UB wind: IF a$="" THEN GOT
O VAL "9590": ELSE LET a=L
```

```
EN a$, a$="PRN_" + a$( TO (
a and a<7)+ ( 6 and a>6)):
LOAD A$ CODE 106200: ON E
RROR GOTO 9900: END PROC
```

In fact, line 11175 is a relocation and slight amendment to the line 7420 as supplied in the original program, and may simply be edited to its new position. The next procedure, 'hlp', which loads new help screens will be dealt with in the final article, but the beginning and end of the procedure is included here so that the commands to call the new procedures can be incorporated in this article.

```
11180 DEF PROC hlp 11195 ON ERR
OR GOTO 9900: END PROC
```

The procedure 'top' allows the top line of printing for each page to be a defined number of standard pitch lines from the top of the page.

```
11200 DEF PROC top
11205 PRINT #5;CHR$ 27;CHR$ 40;C
HR$ 85;CHR$ 1; CHR$ 0; CHR
$ 60
11210 LET a=PEEK (pra+9): IF a>2
4 THEN POKE pra+9,0: GOTO
11210
11215 PRINT #5;CHR$ 27;CHR$ 40;C
HR$ 99;CHR$ 4;CHR$ 0;CHR$
(a*10); CHR$ 0;CHR$ 4
11220 END PROC
```

The next procedure is 'rdfnt' (readfont) which is called when the font menu is displayed.

```
11230 DEF PROC rdfnt
11235 DIM font$(4,16): RESTORE 1
1235: FOR fnt=1 to 4: READ
font$(fnt): NEXT fnt
11240 DATA "Courier/Prestige","R
oman/Sanserif","T_Roman/H_
Sans","Other PRN_"
11245 END PROC
```

Now come the two procedures ('sfnt' and 'lfnt') which save the details of the font in use in any text file and ensure that the same font is loaded when the text file is loaded again.

```
11300 DEF PROC sfnt: IF fnt>1 th
en POKE (pra+11),fnt
11305 END PROC
11310 DEF PROC lfnt: LET ffnt=PE
EK (pra+11)
11315 IF ffnt=fnt THEN END PROC
11320 LET rl=11325: ON ERROR GOT
O prgd: rdfnt: LET fnt=ffn
t: IF fnt=0 THEN LET fnt=1
11325 DIR="/": IF fnt<4 THEN LET
a$="PRN_" + font$(fnt, 1 T
O 5): LOAD a$ CODE 106200:
ELSE IF fnt=4 THEN PRN
11330 hlp: IF dy<10 THEN DIR =ST
R$ dy 11335 ON ERROR GOTO
9900: END PROC
```

The final procedure prevents crashes if text discs which do not contain the 'PRN_' files are in use. It allows for text files to be loaded from earlier discs, and also provides for those users who keep separate program and text discs.

```
11400 LABEL prgd
11405 ON ERROR GOTO 9900: mes "i
nser Secretary disc in dr
ive 1 and press any key"
11410 PAUSE: GOTO rl
```

That completes the new procedures, but some further editing is required so that the procedures will operate.

On loading, the default font is established. to achieve this, line 10 is edited to read:-

```
10 chfnt: hlp: ON ERROR GOTO
9900
```

If you have already incorporated my menu routine for sub-directories, line 10 will read:-

```
10 chfnt: hlp: ON ERROR crdy
(The error trapping routine to line 9900
is at line 20 in this version.)
```

Sometimes it is necessary to change the font of an existing file, which is achieved by editing line 7420 and adding a new line 7425:-

```
7420 DIR="/": chfnt: hlp
7425 IF dy<10 THEN DIR=STR$ dy:
GOTO 75: ELSE GOTO 75
```

A new line is required to reset the printer when the print menu is called because the printer is not now reset within the code files:-

```
6005 PRINT #5;" ";CHR$ 27;CHR$
64
```

The procedure "top" to define the position of the top line of print on the paper is called by renumbering line 6015 as 6020 and adding new lines 6015 & 6017:-

```
6015 IF fnt>1 then top
6017 LET x$="FONT: "+font$(fnt)
:mes x$,6,32-INT(LEN x$/2)
6020 POKE pra+5,ma: CALL 86931
```

Line 6017 also gives a read-out of the font currently in use whilst the Print menu is displayed.

Details of the font in use with a text are saved by adding at the beginning of line 7866 'sfnt' so that it reads:-

```
7866 sfnt: LET n=147456 etc.
```

Similarly, the font in use with a particular text file is loaded by adding at the end of line 7855 'lfnt' so that it reads:-

```
7855 .....GOSUB 3010: lfnt
```

USING THE REVISED PROGRAM

The program is loaded in the normal way.

On entry into *The Secretary* the font menu is displayed with the message 'select default font'. The default font is the font which will be in use for all print unless another font is chosen by subsequent use of the change font routine within the MISCellaneous menu. The default font is selected either by use of the up and down cursor keys and pressing RETURN to load the codes for the highlighted font or by pressing a number (1 - 4) corresponding to the required font.

Existing text files are loaded in the

normal way. If an existing text file has font codes saved with it, the font will be loaded with the text file. Otherwise Courier/Prestige will be loaded, and another font can be called by use of the change font routine within the MISC menu.

Text is entered in the normal way for *The Secretary*, but for Roman/Sanserif and T_Rom/H_Sans the embedded printer control codes for different sizes of print are changed. The new control codes were given in article 2 of this series (see last month's issue). The will be given again in the final article of this series in the form of new HELP screens which will be accessed by CNTRL H. With the exception of SYMBOL O which gives a 'hard' space in T_Rom/H_Sans and toggles proportional spacing off/on in Roman/Sanserif, the codes for these two pairs of fonts are compatible. An attempt to print a text file coded for these fonts from the Courier/Prestige font (and vice versa) will produce some unexpected results!

For Courier/Prestige (with non-scaleable Roman) the program works and prints in exactly the same way as the standard program. The default font may be changed at any time by use of the MISC menu. Either use the cursor keys to highlight 'LOAD PRN CODES' and press RETURN or press P. The font menu is displayed and the new default font is selected in the same way as on loading the program.

Note: the use of this facility changes the font for the whole of the text file. It is not possible to change fonts within a text file other than the other paired file.

e.g. Courier may be interchanged with Prestige, Non-scaleable Roman or non-scaleable Sanserif. Scaleable Roman may be interchanged with scaleable

Sanserif. T_Rom may be interchanged with H_Sans.

On printing, Courier/Prestige operates in the normal way, except that the standard line spacing must be changed to 10 (180ths of an inch) instead of 12 (216ths of an inch).

With Roman/Sanserif or T_Rom/H_Sans the line spacing routine is ignored, because the line spacing is incorporated with the print size. It is, however, necessary with these fonts to ensure that the file begins with a print size code.

The only other change from the standard program when printing these fonts is that 'Paper Length' (H in the Print Menu) is used to start the printing of each page a given number of standard pitch (1/6 of an inch) lines from the top of the page. Thus setting 'Paper Length' to 0 starts the print at the top of each page: setting it to 6 starts 1 inch down from the top of each page and so on. It does not matter what the print pitch as set by the type size is, each line down from the top will still be 1/6 of an inch. If a file set to the scaleable fonts is re-set for Courier/Prestige, remember to change this before printing, otherwise, once again, some very interesting results will be obtained.

Next Month: The new HELP screens.



Dear Editor,

More a set of points than a letter, so I won't bother putting it on disc.

Are you going to advertise the SAM and Speccy Show in Micromart (or let them know, for their 'show calendar' - good idea again.

You said in July '96 issue "SAM now has a presence on the WWW..." There are one or two others but I can't remember them (next time I will) and loads of Spectrum ones. (I could do an article???)

Would you like an article on Spectrum (and some SAM) sites?

My WWW pages have pages on the different user groups - if you want to send me a file 'official' info on yourselves (no charge, I'll return the disc) I can put it there.

More than I intended, but I hope it is interesting.

Yours sincerely, John Garner.

We did try an advert in Micromart for one of the previous shows but, to be honest, it didn't do any good.

And yes, I would love to see anything you can produce about the current crop of Web pages that are sprouting just now. **Ed.**

Dear Editor,

There is a piece of our necessary apparatus which never seems to get an airing in **FORMAT**. I refer to the monitor. I have one for my home set-up but for the one I use at the club I am using a TV set which gives a poor display and I would like to replace it by a monitor. There are many advertised in

YOUR LETTERS

other periodicals but there seems no way of knowing if they are compatible with the SAM output panel and cable. It would be a great help if **FORMAT** would list suitable makes and models.

Yours sincerely, L.W.Simpson.

There has been past coverage of monitors, particularly in Ray Bray's Help Page. However, there is always room for more. The problem is that unless people write to tell us that they have got a particular monitor working we can't tell about them. Of course we also want to hear about monitors that don't work - it may save others some heartache after all. **Ed.**

Dear Editor,

Yes, SAM does have a word-processor for children. The Key Press was one of the excellent educational range produced by David Philpot for SAMCO, and has five levels from infant to fully functional page processor. If E.J.Pettit is still looking for one, I have a last spare copy.

I also have stocks of the early learning joystick made by my old company, Holdfast. It is Atari/SAM joy-stick compatible, and my teenage kids still prefer it for platform games, road races and Astroball.

My address is: Park view, Queenhill, Upton-on-Severn, Worcs. WR8 0RE, and answerphone number: 01684 594702.

By the way, why do we never seem to hear of Tim Humphries' superb SAM MIDI sequencer?

Yours sincerely, Guy Inchbald.

I must admit I never saw a copy of Key Press when SAMCO launched it - can't

understand why but that's life... It was one of the titles that Revelation took over from SAMCO but they never re-released it. If other people are interested then badger Revelation.

As to the Midi Sequencer software. Tim seems to have gone to ground and as he never signed the program to SAMCO/Revelation (he only had SAMCO selling it on his behalf) I don't know what has happened to the program. **Ed.**

Dear Editor,

I am hoping that this letter will not be too long. As you keep saying please keep them short. So I will have a go.

Having got hold of a SAM Coupé last year, and just over two months ago getting hold of a PLUS D for my Spectrum +2. With a great deal of discs for both set up's, and a large collection of **FORMAT** mags. You can see that I have had my work cut out trying to sort myself out. But I think that I am now beginning to see the wood for the trees.

Well! my first question is about Lerm Software, and Betterbytes, are they still in business, if not, has anyone taken over their software distribution?

Next! I know that Vols 1, 2 and 3 are no longer available, but I will ask if there is any chance that someone might have spare copies of Vol 3 N's 1 and 10, as for some reason they are missing from the collection of mags. I got them with the PLUS D, can anyone help me, even to borrow them so that I could photocopy them both. **PLEASE.**

By the way while I am on about the **FORMAT** mags, is there any more news as regards to an index for them? I have made up one of some of the articles I may find of use, but a complete one, would be a great deal better.

Now a moan. I have written to FDOS in Poole twice, about CPM software for the SAM and PRODOS together with an SAE, and still no reply. I cannot seem to find a telephone number, so what do I

have to do to get a reply?

This next one, I think is for Jenny. I have been reading about the FAST FILE program in the back no's of **FORMAT** and I see that you require two first class stamps to cover the cost of copying the program, so enclosed two stamps, please forward them with my next copy of **FORMAT**. Thank you Jenny.

Can anyone help me with the connections for a lead for the RS232 socket on the back of the +2 Spectrum, ie. The six pin BT plug and a serial printer lead. Also the connections for another lead to connect the RS232 socket on the +2 to the RS232 socket on the back of the COMMS interface for the SAM.

This I think is going to be my last question, and it is about **TASMAN** software. I have nearly all their software (except the +3) programs and I am wondering if the **TASSIGN**, **TASCALC**, **TASDIARY**, and **TASWORD+2** software can be converted to PLUS D. If so can anyone help please.

Well I think that has be all I have to say, and I do hope I have not asked too much.

Best regards to you all at **FORMAT**, and keep up the good work.

Yours sincerely, Peter Deane.

You lucky, lucky man you... Jenny just happened to have two spare copies of V3/1 and a handful of number 10, so out of the generosity of her heart (lovely soul that she is) you will have found a copy of each in this months envelope. (this of course means that we now have one single copy of issue 3/1 which, because it is now so rare, we can offer to one lucky reader for the princely sum of £1,000 o.n.o.)

Both Lerm and Betterbytes have now passed by the wayside. You could try Fred Publishing for Lerm's SAM software, they had a few bits at the last Gloucester show. But Betterbytes, and

Lerm's Spectrum software is no longer available except on the second hand market.

Your question on the RS232 connections has been passed to the Help Page.

Regarding the old Tasman software, TW+2 is convertible, TasSign converts (I think) quite easy as the loading and saving is in Basic. Any reader know about the others? **Ed.**

Dear Editor,

Today I received a letter from Bull Electrical and they have some Amstrad 3" discs for sale. I don't use them myself but I understand they are in short supply. This information could help some of your readers.

Their address is: Bull Electrical, 250 Portaland Road, Hove, Sussex, BN3 5QT. Tel 01273 203500.

Yours sincerely, Jack Bailey.

Dear Editor,

I have been a member of INDUG since 1987 but this is the first time I have written to you. I rang your office last week, enquiring if you had any PLUS Ds left. A very nice young lady informed me you had not. Datel does not make them anymore either.

I am looking for one as the one I am using has gone wrong? The disc side is working, but the printer side will not now respond to printer instructions. I got it to work at one point, but next day it would not work the printer again. I have a Star NL10 printer which works when I press MODE and then switch on, so I am looking for a PLUS D 2a version (new or second hand) could you please place an advert in **FORMAT** I am willing to pay for the advert. I have two spare computers, one a 48K Rubber Keyboard, (new membrane fitted) and a 48+ (new membrane fitted). I am 72 years old and my Spectrum 128+2 (grey case) and disc drive and printer keeps me going. I do

hope I am not too much trouble to you.

Thanking you.

Yours sincerely, S.L.Round.

You're not troubling us at all Mr Round, helping people is what we are here for. We've put your advert in the Small Ads section, something we do not charge members for by the way, and I hope you get a reply.

In the meantime, the fault you report may be quite minor but it could be either the PLUS D, the printer cable or the Star NL10. Just because the printer does its own built-in test print it does not mean the fault is not in the printer. If you pack up the PLUS D and printer cable (in a padded envelope is best) and send it down to us, we will check it out for you and (if possible) get you up and running again. **Ed.**

Dear Editor,

I enclose my cheque for another year's supply of your excellent magazine. I have looked through the last twelve months and I am sorry to say again that I am unable to select three articles that I enjoyed most or that I did not enjoy. As usual the balance of articles appears to be about right covering Spectrum and SAM and all the new developments such as the Hard Drive and SAM C.

I am pleased to hear that the next Show has been announced with plenty of notice as I have wished to attend since your first one but have been unable to make it. I would like to be added to the list of those requiring a lift if anyone is going from my area of East Sussex. I last went to one of the All Format shows held in London. I have enquired about travelling to Gloucester on the train but the travelling time exceeds the time I would get to spend at the show.

I would like to visit the show to get a look at the Hard Drive and also see SAM C in action and any new programs available for the SAM.

You will be pleased to know that I am

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SCADs PD Yes, at last, we are please to re-release SCADs - the arcade game development system for SAM. Previously sold by Glenco at £24.95 we have now placed the software into the Public Domain so the disc costs you Only £2.50. The full manual (over 200 pages) is also available for £12.95 (overseas please add an extra £1 to postage rates below)

- All prices include UK postage and packing (Europe please add £1, other overseas please add £2).
- Payment by UK cheque (made payable to Revelation Software), PO or cash. Sorry but we can't accept orders by Euro-cheque or Giro.
- Please Quote INDUG membership number clearly on order if claiming discount.

Revelation
Software

Revelation Software, 45, Buddle Lane, Exeter, EX4 1JS.

spreading the word INDUG to all the PC users I know. I have photocopied your leaflet about FORMAT PC and I am passing them to my friends and colleagues.

I shall be passing one to my brother-in-law who's PC I have been looking after for him while he has been on holiday. Although I have had several opportunities in which to use it I have preferred to use my own SAM.

This letter will probably arrive too late for the August issue so let me be one of the first to wish **FORMAT** Happy Ninth Birthday.

Yours sincerely, Colin Rout.

Many thanks for you efforts Colin, we could do with lots more people spreading the word as you are. And thanks for the birthday wishes. Ed.

Dear Editor,

I have just received the July 1996 issue of **FORMAT** that also enclosed the flyer for the new **FORMAT** PC. I wish to congratulate you and your highly talented team for this very timely concept of expanding the horizon of computation from Spectrum & SAM to encompass PC also. It suits me beautifully, since I am a dual user - of Speccy 128 with DISCiPLE, and, PC with Pentium 100.

I shall indeed be very grateful if you could kindly help me to clear up some confusion in my mind: a) is **FORMAT** going to be merged with **FORMAT** PC or are they going to be different publications; b) do we pay two subscriptions or one (which is enhanced to £40 p.a. for overseas subscribers); and, c) my current subscription runs till October 96, if the change in subscription rates comes into force with immediate effect then what happens to my old balance subscription (Aug-Oct)?

While I am enthusiastic about **FORMAT** PC, I have no intention to lose out on **FORMAT**. Over the years this

has been my friend, philosopher, and guide in my massive operations on Workhorse Speccy! Please let me know how much I need to send in sterling for ensuring my enjoyment of dual benefits. Incidentally, is the introductory discount offer valid for us poor overseas subscribers also?

Thanking you and with my Best Wishes for **FORMAT** and/or **FORMAT** PC in 1996!

Yours sincerely, D.P.Dutta.

No Mr Dutta, **FORMAT** and **FORMAT** PC are two separate mags. Yes there will be ways to have dual subscriptions, we are experimenting with how to handle that on the computer system at the moment. For the moment there are still a few delays on the first issue but as soon as it is out we will let you know how to get hold of a copy. Ed.

Dear Editor,

I am just writing to put forward a few points, raised by Mark Sturdy in his recent 'epic'.

5) Miles Kinloch has written a number of routines and programs for the PCG package, which would be worthy of featuring with new copies.

6) A collective database of users is a nice idea, but is it feasible? Certain groups may not be willing to participate, as it would reveal how many (or how few) readers they have! At present, most of the Spectrum groups who work with each other share their customers by way of putting flyers from others with their letters and outgoing orders, at no cost. This works very well. Another important fact to consider is the fact of unsolicited mail. People don't want to be swamped with rubbish.

12) A number of companies are unco-operative about releasing their old Spectrum products. Hisoft, for example, are not at all bothered that their three major Spectrum programs (Devpac, Basic and Pascal) are still wanted. They

find it amusing to snigger at Spectrum users and say that we will have to wait 99 years until the copyright expires. I hope that PC and PCW readers will remember this when considering purchasing any of Hisoft's current products. However, some other software houses have been great, such as Gremlin Graphics and Mikro-Gen.

There is a list of ex-commercial games which have been allowed re-distribution. It contains around 150 top class titles, acquired by Alchemist Research and others, and are now distributed by the software libraries Alchemist (no connection!), Fountain, Impact, and WoMo.

There is also a large database of Spectrum titles on the PC. Ronald Raaijen, who works for the SGG group, has compiled it, which features almost every Spectrum game, it's author, software house, type, and even it's filename on the Spectrum Emulator games CD-ROM. It just needs the gaps of a few titles filling in before it's to be distributed.

Yours sincerely, Andy Davis.

Dear Editor,

I'm phoning this message through because it would take too long to reach you by post as Royal Mail in Milton Keynes where I live are out on strike at the moment (in addition to the national dispute).

Anyway, I have a Philips CM8533 monitor and wanted to attach it to my Spectrum +2 (grey). I've found a company called Meadmore (telephone 0151 5212202) who can supply a cable to

Letters may be shortened or edited to fit on these pages although we try to edit as little as possible.

This is YOUR letters page so it is up to you to fill it with interesting things. Come on, get writing, any subject even remotely related to computers. Just keep things as short as you can so we can fit in as many as possible each month. Please write clearly or type your letters. Send them to the address on page 3 or fax them to us on 01452 412572.

do the job. Their part number is K2241 for the one I wanted but they said they would produce cables for almost any computer/monitor.

Hope this information will help other readers.

Yours sincerely, Philip Smith.

Thanks Phil, I'm sure others will be interested. **Ed.**

SMALL ADS

WANTED Software on disc for +3. Any subject. I'm disabled so please drop me a line (cards preferred). A.J.Harding, 25, Churchdown Lane, Hucclecote, Gloucester, GL3 3QH.

CAR SHARE Lift required to Gloucester show, by Colin Rout, 10, Park Drive, Hastings, East Sussex, TN34 2PR. Tel: 01424- 441229.

FOR SALE Spectrum software. SAE to Nick Cheesman, 70, Wellesley Close, Ash Vale, Aldershot, GU12 5SP.

WANTED Working PLUS D - interface only. See my letter in this month's Your Letters for why I need it. Mr S.Round, 25, Victoria Road, Stirkley, Birmingham, B30 2LS. Tel: 0121-459-5217.

WWW PAGE Covers Spectrum demos, user groups, clubs, ect. <http://www.nvg.unit.no/spectrum/jmg7/> John Garner.

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COMPANY : West Coast Mail Order. ADDRESS : % Format Publications, 34, Bourton Road, Gloucester, GL4 0LE. CONTACT : PHONE : 01452 412572	PRODUCT/SERVICE : The mail order division of West Coast Computers - the manufacturers of the SAM computer and peripherals.
COMPANY : Z2 Publications. ADDRESS : 3, Station Road, Stockport, Cheshire, SK12 5BP. CONTACT : Mat Beal. PHONE : 01663 743397	PRODUCT/SERVICE : Z2 fanzine - A5, Bi monthly for Speccy only. Also Software publication in the form of the FISHPASTE compilations.
COMPANY : Zenobi Software. ADDRESS : 26, Spotland Tops, Cutgate, Rochdale, Lancashire, OL12 7NX. CONTACT : John. PHONE : Not available.	PRODUCT/SERVICE : Write, produce and publish adventure games for the Spectrum range of machines. Also produce 'Spectrum-emulations' of these games to suit the following other formats....MAC, Amiga, PC and Atari.
COMPANY : Zodiac Magazine/Zedd Soft. ADDRESS : New House, Holbear, Chard, Somerset, TA20 2HS. CONTACT : PHONE : 01460 62118	PRODUCT/SERVICE : Zodiac Magazine: Bi-Monthly, SAM only, paper based magazine featuring all the latest news, reviews, previews and features. Zodiac PD: SAM's second largest PD Library. Zedd Soft, SAMs only budget Software label: VOID (SamCo Compilations) Joy-stick Power.

In constructing this directory we sent out entry forms to many companies whose addresses we had gathered over the last few years. However, quite a few did not return their forms and we were therefore unable to include them in this first issue (although we believe many of them are still in business).

While we have tried our hardest to ensure that the data contained in this directory is correct at the time of going to press, we will not be liable for any errors or omissions however they have arisen. If any reader finds an error then please let us know by writing to Format Publications at the usual address so that we can make corrections in the next issue of this directory. Likewise, if you know of any company that you feel should have been in this directory but is not, then let us have details of the company's name and address and we will try and solicit an entry for the next issue of the directory.

Please remember that if you are writing to a company to ask for more details on the products or services they provide (and it is true to say that some of them could have filled several times the space we allowed them) then the courteous thing to do is to send a stamped addressed envelope for their reply. Please also take the time to mention that you saw their entry in this directory.

It only remains for me to thank all those who took the time to fill in their entry forms and to hope that **FORMAT** readers will find this directory useful, informative and above all worth keeping.

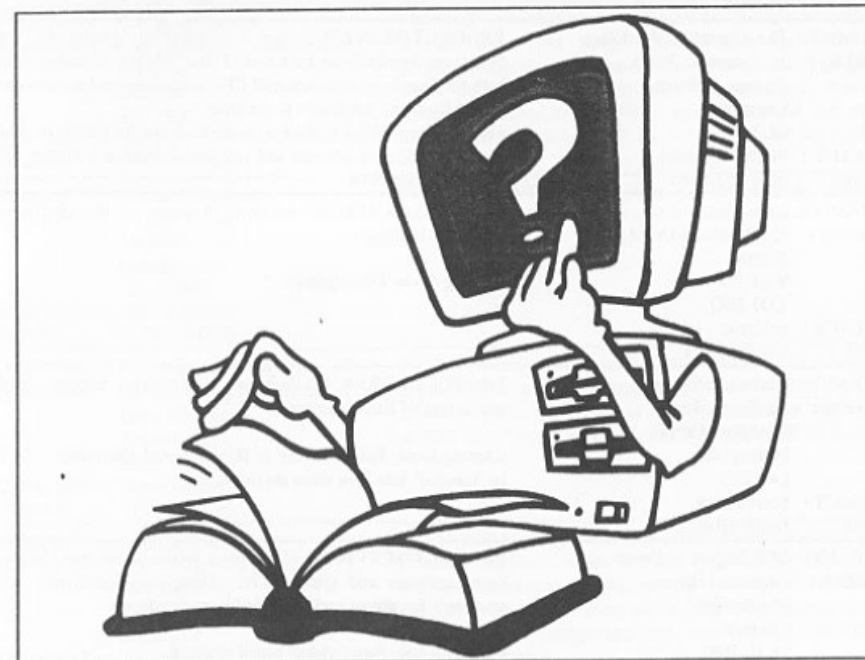
Jenny Bundock.

Issue N°1.

September 1996.

FORMAT

SPECTRUM & SAM RESOURCE DIRECTORY



Find What You Need
The Easy Way.

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COMPANY : Ability Microsystems Limited. ADDRESS : 239a London Road, Hadleigh, Benfleet, Essex, SS7 2RF. CONTACT : Stephen Salmon. PHONE : 01702 554256	PRODUCT/SERVICE : Education Specialist - mainly for Acorn and IBM PC's. <i>Coming Soon.</i> A range of external 3½" floppy disc drives and IDE Hard drives. Though built for Acorn machines, they will obviously be useful to Spectrum/SAM owners. Also working on a 'copyright approved' emulation CD-ROM for Acorn/PC's.
COMPANY : Ace Software. ADDRESS : 18, West Street, Geddington, Northants, NN14 1BD. CONTACT : Alan Cresswell. PHONE : Not available.	PRODUCT/SERVICE : Spectrum Software titles on cassette and +3 disc. All originals. Also Books and some hardware. Previously designed/programmed games for the Spectrum: 3D Stock cars, 3D Stock Cars II, 3D Grand Prix Championship. These are now available from me on +3 disc along with 'Ace Designer' Screen designer. Other 8 Bit Software also available. <i>Coming Soon.</i> More titles added to the list every week.
COMPANY : Adventure Probe. ADDRESS : 52, Burford Road, Liverpool, L16 6AQ. CONTACT : Barbara Gibb. PHONE : 0151 280 5616	PRODUCT/SERVICE : Publication of a long running monthly magazine for Adventurers. Also some software available.
COMPANY : The Adventure Workshop. ADDRESS : 36, Grasmere Road, Royton, Oldham, Lancashire, OL2 6SR. CONTACT : Philip Reynolds. PHONE : 0161 652 7565	PRODUCT/SERVICE : Over 100 adventure games for the Spectrum. Available on tape and +3 disc. We sell adventures for both the Spectrum and Amstrad CPC computers and we convert games from one computer to the other. <i>Coming Soon.</i> We are always on the look-out for games for both machines and will convert and sell games from any author who wishes to contact us.
COMPANY : Arrow Software. ADDRESS : 15, Danebury Drive, Acomb, York, YO2 5EQ. CONTACT : Andrew. PHONE : Not available.	PRODUCT/SERVICE : All types of games for the Spectrum, at very little charge. <i>Coming Soon.</i> More games...
COMPANY : Atomik Software. ADDRESS : 20, Grove Road, Hoylake, Wirral, Merseyside, L47 2DT. CONTACT : Steven Pick. PHONE : Not available.	PRODUCT/SERVICE : Samdisk (disczine). Editing and production of Blitz (disczine). <i>Coming Soon.</i> Future issues of Blitz planned, Samdisks 1-16 to be 'merged' into four separate discs.
COMPANY : BCS/Softcat Software. ADDRESS : Grantham House, Macclesfield, Cheshire, SK10 3NP. CONTACT : PHONE : 01625 615379	PRODUCT/SERVICE : Multimedia products. Mainly 'Video' based software and systems (PC, Amiga and Spectrum). We also carry Spectrum and SAM Software/Hardware. <i>Coming Soon.</i> New 'video' based products.
COMPANY : Mr C.Box. ADDRESS : 31, Stanley Street, Semilong, Northampton, NN2 6DD. CONTACT : Christopher Box. PHONE : Not available.	PRODUCT/SERVICE : External 720K floppy disc drive for the ZX Spectrum +3.

COMPANY : Chic Computer Club. ADDRESS : P.O.Box 121, Gerrards Cross, Bucks, SL9 9JP. CONTACT : PHONE : 01753 884473	PRODUCT/SERVICE : General computer user group with special interest sections for many machines including the Spectrum. Also Spectrum PD Library, Book Library.
COMPANY : Classix Enterprises. ADDRESS : 11, Finsbury Drive, Wrore, Bradford, West Yorks, BD2 1QA. CONTACT : James Waddington . PHONE : 01274 590559 (After 7pm.)	PRODUCT/SERVICE : Bi-Monthly fanzine dedicated to old/classic Spectrum software and hardware - called Classix. Also games finder service and large selection of second-hand Spectrum software for sale. <i>Coming Soon.</i> Planning on doing a games finding service and software for sale for SAM, C64 and Amstrad.
COMPANY : CLP Computer Supplies. ADDRESS : Units 7 & 8, Holland Way, Blandford, Dorset, DT11 7TA. CONTACT : Simon Rigby. PHONE : 01258 459544	PRODUCT/SERVICE : Mail Order computer supplies. Also do a 'In a Jiff' service for £1.99 which is handy for people who only want one item.
COMPANY : Computer Cavern. ADDRESS : Capri House, 9, Dean Street, Marlow, Bucks, SL7 3AA. CONTACT : Richard. PHONE : 01628 891022	PRODUCT/SERVICE : Retailer of all formats of computer products since 1984. Large stock of Spectrum (and a little SAM) software including games, business and utility programs. Also stock 3" discs, Microdrive cartridges, Rotronics Waferdrive wafas, cables, PSUs, dust covers and lots of odd items - <i>send us your wish list, we can only say no.</i> Mail order or visit our shop.
COMPANY : Crashed Magazine. ADDRESS : 16, The Avenue, Manston, Leeds, LS15 8JN. CONTACT : Allan Clarkson. PHONE : 0113 232 6726	PRODUCT/SERVICE : 20 Page A4 Magazine for Spectrum. Also Crashed T-Shirts, Posters, Mail Order Software.
COMPANY : DCP Microdevelopments Ltd. ADDRESS : Edison House, Bow Street, Great Ellingham, Attleborough, NR17 1JB. CONTACT : David Palmer. PHONE : 01953 457800	PRODUCT/SERVICE : Low cost control interfaces with relays, stepper motors and analogue converters. Ideal for simple robotics, control measurement etc. Established in 1981 - first product the 'P-Pack' for ZX81, a control pack with 4K RAM.
COMPANY : Einstein User Group. ADDRESS : Ivy Cottage, Church Road, New Romney, Kent, TN28 8TY. CONTACT : A.E. Adams. PHONE : Not available.	PRODUCT/SERVICE : The RPM Historical Society, Steam Printing and Horse Tram Society, Old Copiers User Group. Software, magazines/newsletters and user support for obsolete computers, obsolete printing and reprographic equipment. Core activity is user group/magazine for Tatung's Z80 Based, Einstein Computer.
COMPANY : Express Software. ADDRESS : 7, Manor Drive, Merriott, Somerset, TA16 5NT. CONTACT : Richard Coles PHONE : Not available.	PRODUCT/SERVICE : Graffixmas clipart pack for 48/128 Spectrum. Available on tape or PLUS D disc.

COMPANY : Fairweather and Beeton. ADDRESS : 46, High Road West, Felixstowe, Suffolk, IP11 9JE. CONTACT : Alf Fairweather. PHONE : 01394 273178	PRODUCT/SERVICE : 'The Thing Monthly' a fanzine (which isn't monthly anymore) incorporating 'Your Thingclaire' bit for stuff about computers in general. (And it's Free of Charge).
CONTACT : Flexibase Services. ADDRESS : 20, The Parklands, Droitwich Spa, Worcestershire, WR9 7DL. CONTACT : David Wornham. PHONE : 01905 775840	PRODUCT/SERVICE : Software for safety - interactive and multi-choice quizzes on crime prevention, personal safety and road safety. Versions available for Spectrum PLUS D, +3, SAM and the PC.
COMPANY : Format Publications. ADDRESS : 34, Bourton Road, Gloucester, GL4 0LE. CONTACT : Jenny Bundock. PHONE : 01452 412572	PRODUCT/SERVICE : Well, we had to include ourselves didn't we. Still, just for the record, here is what we do. Monthly magazine, everything for the Spectrum, SAM and (when we can) other Z80 computers. Wide range of software, hardware and technical support for the Spectrum and SAM. Fast efficient SAM repair service. Organizers of the twice yearly Gloucester shows. Publishers of this directory. Nice people too...
COMPANY : Fountain PD. ADDRESS : 11, Camel Road, Silvertown, London, E16 2DE. CONTACT : Dave Fountain. PHONE : 0171 4765915	PRODUCT/SERVICE : PD Library covering full range of software, for tape, PLUS D, +3, MDU, Opus, - Graphics, Clipart, fonts, programming, sound/music, business, application, printer, educational, games, adventures, fanzines and demos! <i>Coming Soon.</i> Spectrum book lending library. Issue 3 catalogue Sep 9. Fanzine distribution.
COMPANY : Fred Publishing. ADDRESS : 40, Roundyhill, Monifieth, Dundee, DD5 4RZ. CONTACT : Colin Macdonald. PHONE : 01382 535963	PRODUCT/SERVICE : 'Fred' - A monthly SAM disc magazine. Superb range of SAM software including licenced conversions like Lemmings etc. Also stock a wide range of SAM software from a variety of publishers. <i>Coming Soon.</i> More new games for SAM. See us at the Gloucester shows.
CONTACT : Galaxy Software. ADDRESS : 43, Gwydir Street, Toxteth, Liverpool, L8 3TJ. CONTACT : Leon Brown. PHONE : 0151 728 9084	PRODUCT/SERVICE : Spectrum software, also Hammer PD library and Eight Bit Alliance user group.
COMPANY : Grafix Wizards. ADDRESS : 5, Helmsley Drive, Eastwood, Notts, NG16 3RS. CONTACT : Jonathan Cauldwell. PHONE : Not available.	PRODUCT/SERVICE : Spectrum Arcade games and utilities. <i>Coming Soon.</i> August 1997 will be Grafix Wizards 10th Anniversary so look out for some special offers over the coming months!
COMPANY : W.Hall & Sons. ADDRESS : 147, Gladstone Street, Winsford, Cheshire, CW7 4AU. CONTACT : Bill Hall. PHONE : 01606 551925	PRODUCT/SERVICE : Software package to convert Spectrum into a Video titling character generator. Established in 1985 this package was the first video titling software for any home computer.

COMPANY : Hilton Computer Services Ltd., ADDRESS : 3, Suffolk Drive, Guildford, Surrey, GU4 7FD. CONTACT : Jack Gibbons. PHONE : 01483 826375	PRODUCT/SERVICE : Personal Banking System (Spanish also available) for Spectrum (tape, microdrive or disc), ZX81, CPC, QL, PC, SAM. Also PBS Budget Module, Personal Filing System for SAM. <i>Coming soon:</i> Data Entry Toolkit for SAM, useful entry, validation, display routines + read/write records using keyed serial/random access files (incl. hard disc). Also Hilton's Casino, gambling games collection. Do you feel lucky!
COMPANY : Holdfast Computing. ADDRESS : Park View, Queenhill, Upton-on-Severn, Worcestershire, WR8 0RE. CONTACT : Guy Inchbold. PHONE : 01684 594728	PRODUCT/SERVICE : Early learning Joypad, also used for special needs. Joy-stick compatible. We can also supply a range of SAM cables to order, and (if you can afford it!) provide professional technical documentation services.
COMPANY : HS Computers. ADDRESS : Unit 2 The Orchard, Warton, Preston, Lancs, PR4 1BE. CONTACT : Bill Harison. PHONE : 01772 632686	PRODUCT/SERVICE : Computer Repairs (All Spectrum range).
COMPANY : IEBA. ADDRESS : Harrowden, 39, High Street, Sutton, Ely, Cambs, CB6 2RA. CONTACT : Brain Watson. PHONE : 01353 777006	PRODUCT/SERVICE : The IEBA (the Independent Eight Bit Association) is a cross-format association devoted to the promotion of the benefits of 8 Bit computing. It is non profit making, and run by a committee or representatives from the principal 8 Bit computers. Its first major work is the publication (free to members) of a directory of 8 Bit computer services.
COMPANY : Impact Software. ADDRESS : 36, Budge Road, Wokingham, Berkshire, RG40 1PJ. CONTACT : Paul Howard. PHONE : 01734 891292	PRODUCT/SERVICE : Commercial quality software (Gremlin, Vortex etc.), Sold in compilations on PLUS D 3½" disc only. A few discs are public domain. Working demo of a new windows style environment available - being written by ISW in house team.
COMPANY : J & P Electronics Ltd., ADDRESS : Unit 45 Meadowmill Estate, Dixon St, Kidderminster, DY10 1HH. CONTACT : J.E.Price. PHONE : 01562 753893	PRODUCT/SERVICE : Computer, Monitor, Printer Repairs. Some amateur Radio Software for Spectrum.
COMPANY : Kobrahsoft Software. ADDRESS : Pleasant View, Hulme Lake, Hulme, Longton, Stoke-on-Trent, ST3 5BH. CONTACT : Mr Cope. PHONE : 01782 305244	PRODUCT/SERVICE : We sell a wide range of Spectrum and SAM Software and utility programs.
COMPANY : MDL Software. ADDRESS : Holmrigg, Wester Essendy, Blairgowrie, Perthshire, PH10 6RD. CONTACT : Douglas Young. PHONE : 01250 884309	PRODUCT/SERVICE : Disc Magazines Sam2Sam and Daft. Games: X-Sights 1 and 2, Addiction. Compilation discs and Several (10+) Volumes of Screens discs (over 100 products). <i>Coming Soon.</i> Two licenced games.

COMPANY : Micro Spec Software. ADDRESS : 22, Bond Street, Innerleithen, Peeblesshire, EH44 6HW. CONTACT : Jamie Smith. PHONE : 01896 830560	PRODUCT/SERVICE : Both games and educational software on 3"disc and tape. My software isn't PD but very low cost.
COMPANY : Mira Software. ADDRESS : 48, Lodge Close, Marston, Oxford, OX3 0QP. CONTACT : Stephen Lee. PHONE : 01865 204706	PRODUCT/SERVICE : Skyplot Program, Fortran Compiler, Pascal Compiler, Modula-2 Compiler (All for Sinclair Spectrum). <i>Coming Soon.</i> MiraCalc spreadsheet/programming language for the PCs.
COMPANY : Mungus Software. ADDRESS : Moorview, Leigh Road, Chulmleigh, North Devon, EX18 7BL. CONTACT : Stephen McGreal. PHONE : Not available.	PRODUCT/SERVICE : Games with Quazar surround support. Current games available are Blokker, Puzzle Game with Quazar support. Impostors, Lemmings style puzzle/platform game with Quazar support <i>Coming Soon.</i> Spam Sandwiches, a compilation of small games, and Big Gunz, a shoot em up.
COMPANY : Outlet Computer Club. ADDRESS : 34, Saltersgate Drive, Birstall, Leicester, LE4 3FF. CONTACT : Ron Cavers. PHONE : Not available.	PRODUCT/SERVICE : A monthly disc magazine for hobbyists - containing programs/articles/letters/demos/hints & tips/short routines etc., The disc is available for DISCiPLE, PLUS D, +3 and PC. Published monthly since September 1987.
COMPANY : Quazar. ADDRESS : 204, Lamond Drive, St. Andrews, Fife, KY16 8RR. CONTACT : Colin Piggot. PHONE : Not available.	PRODUCT/SERVICE : Quazar Surround - 16 bit sound card for SAM. Quazar Surround Sampler Module - Sound sampler for the Quazar surround. Quazar Studio, Quazar video, Super bike championship, Soundbyte, Chess Mate. <i>Coming Soon.</i> Several new software titles.
COMPANY : Revelation Software. ADDRESS : 45, Buddle Lane, Exeter, EX4 1JS. CONTACT : Frank Broughton. PHONE : Not Available.	PRODUCT/SERVICE : One of the largest range of both games and serious software for the SAM. <i>Coming Soon.</i> New games including a SAM conversion of Elite.
COMPANY : SAM PD. ADDRESS : 18, Mill Lane, Skelmersdale, Lancashire, WN8 8RH. CONTACT : Derek Morgan. PHONE : 01695 731163.	PRODUCT/SERVICE : The largest range of SAM PD software there is. Quick and reliable service with the very latest items available. Also F9 Software - non-PD software. <i>Coming Soon.</i> Video digitiser for SAM. See us at the Gloucester show.
COMPANY : Saturn Software. ADDRESS : 5, Ivanhoe Drive, Ashby De La Zouch, Leicestershire, LE65 2LT. CONTACT : Darren Wileman. PHONE : 01530 416207.	PRODUCT/SERVICE : Network Sigma - bi-monthly disc magazine for SAM. Easy Disc - File Utility, Driver Icons 1 + II. Also software publishing, currently publishing MDL Softwares titles.

COMPANY : SD Microsystems. ADDRESS : PO Box 24, Attleborough, Norfolk, NR17 1HL. CONTACT : Steve. PHONE : 01953 483750.	PRODUCT/SERVICE : Software and supplies for Amstrad CPC's, PCW's and Dos PC's including the 1512/1640 range.
COMPANY : SD Software. ADDRESS : 70, Rainhall Road, Barnoldswick, Lancashire, BB8 6AB. CONTACT : Nev Young. PHONE : Not available.	PRODUCT/SERVICE : SAM IDE hard disc interface. SAM software including Specmaker and PC Suite. Spectrum software for DISCiPLE and PLUS D.
COMPANY : Sintech GBR. ADDRESS : Gastackerstr. 23, 70794 Filderstadt, GERMANY. CONTACT : Thomas Eberle. PHONE : 01049 711 775033	PRODUCT/SERVICE : Old software from known producers like Ocean, US Gold.... New software from Eastern Europe by unknown software houses. Every kind of used hardware. New interfaces, some small add-ons. Disc drives and power supplies. Also have a repair service. Our distributor for new software in Britain is Trading Post. <i>Coming Soon.</i> SDA sound interface and new games.
COMPANY : SPC (Spectrum and SAM Profi Club). ADDRESS : Wolfgang and Monika Haller, Penningsfelder Weg 98a, D-51069 Koln, GERMANY. CONTACT : Wolfgang and Monika Haller. PHONE : 0049 221 685946	PRODUCT/SERVICE : Monthly paper mag with 16 pages A5 for Spectrum and SAM. Very large PD service for Spectrum. Club repair service for Spectrum and Spectrum hardware. Help on request, ie for using PD programs written in German.
COMPANY : Steves Software. ADDRESS : 7, Narrow Close, Histon, Cambridge, CB4 4XX. CONTACT : Steve Nutting. PHONE : 01223 235150	PRODUCT/SERVICE : Specialists in Desk Top Publishing software for the SAM. Also clipart collections, photo scanning, and printer software.
COMPANY : Sword Software. ADDRESS : 19, Great Leaze, Cadbury Heath, Bristol, BS15 5AT. CONTACT : Gary Pearman. PHONE : 0117 9832522	PRODUCT/SERVICE : Adventure games for all Spectrums, Public Domain for the Amiga. Can supply spare +2/+3 keyboards/keys and many other spares such as IC's (Z80A, 4116's, etc.)
COMPANY : Tasman Software. ADDRESS : Hilton Court, 2, North Hill Road, Leeds, LS6 2EN. CONTACT : Robin Thomson. PHONE : 0113 243 8301	PRODUCT/SERVICE : Tasword Two (48k), Tasword +2 and Tasword +3 word processing programs for the appropriate .
COMPANY : TIS. ADDRESS : 76, Church Street, Larkhall, ML9 1HE. CONTACT : Craig. PHONE : 01698 883334	PRODUCT/SERVICE : Service Manuals and Info (including all versions of Spectrum).